OPTIMAL STORAGE ON TAPES

We want to store files of lengths (in MB) {12,34,56,73,24,11,34,56,78,91,34,91,45} on **three** tapes. How should we store them on the three tapes so that the mean retrieval time is minimized?

SOLUTION: STORE FILES BY NONDECREASING LENGTH

First sort the files in increasing order of length. For this we can use heapsort, meregesort or quicksort algorithms.

11	12	24	34	34	34	45	56	56	73	78	91	91

Now distribute the files:
First element 11

Tape 1	11												
Tape 2													
Tape 3													

Second element 12

Tape 1	11												
Tape 2	12												
Tape 3													

Third element 24

Tape 1	11												
Tape 2	12												
Tape 3	24												

Fourth element 34

Tape 1	11	34											
Tape 2	12												
Tape 3	24												

Fifth element 34

Tape 1	11	34											
Tape 2	12	34											
Tape 3	24												

Sixth element 34

Tape 1	11	34											
Tape 2	12	34											
Tape 3	24	34											

Seventh element 45

Tape 1	11	34	45										
Tape 2	12	34											
Tape 3	24	34											

Eigth element 56

Tape 1	11	34	45										
Tape 2	12	34	56										
Tape 3	24	34											

Ninth element 56

Tape 1	11	34	45										

Tape 2	12	34	56										
Tape 3	24	34	56										

Tenth element 73

Tape 1	11	34	45	73									
Tape 2	12	34	56										
Tape 3	24	34	56										

Eleventh element 78

Tape 1	11	34	45	73									
Tape 2	12	34	56	78									
Tape 3	24	34	56										

Twelth element 91

Tape 1	11	34	45	73									
Tape 2	12	34	56	78									
Tape 3	24	34	56										

Thirteenth element 91

Tape 1	11	34	45	73									
Tape 2	12	34	56	78									
Tape 3	24	34	56										